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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/484,650	01/18/2000	Thomas Ahrndt	P99.2498	9932
28970	7590	08/20/2004	EXAMINER	
SHAW PITTMAN IP GROUP 1650 TYSONS BOULEVARD SUITE 1300 MCLEAN, VA 22102			VOLPER, THOMAS E	
			ART UNIT	PAPER NUMBER
			2665	

DATE MAILED: 08/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 09/484,650	Applicant(s) AHRNDT ET AL.	
	Examiner Thomas Volper	Art Unit 2665	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 06 July 2004.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Response to Arguments*

1. Applicants' arguments filed 6 July 2004 have been fully considered but they are not persuasive.
2. In response to Applicants' argument that Bartkowiak (US 6,665,350) does not teach combining the A/D converter, sample buffer, and detector of Yamano (US 6,075,814) in one device, the Examiner respectfully disagrees. Applicants' contend that Bartkowiak is directed to sampling *analog* waveform signals, whereas Yamano discloses a *digital* sample buffer. Even upon cursory inspection it is clear that Bartkowiak is indeed concerned with detecting tones in the *digital* domain. Figure 2A clearly shows a Sequential Stream of *Digital* Samples (212) inside of the Multi-Frequency Multi-Tone Detector (235). The input signal is of course an analog signal, due to the fact that it is a DSL signal. However, the signal must be converted to a *digital* signal in order to detect the particular tones, which is a feature present in both Yamano and Bartkowiak. Since Bartkowiak discloses sampling (which inherently requires the use of some sort of buffer) and conversion from analog to digital and tone detection all within a single device, it is obvious that these elements be combined into a single device in the invention of Yamano.
3. In response to Applicants' argument that neither Bartkowiak nor Yamano teach that both a *sample buffer* and an A/D converter must be added to a non-idle detector (tone detector) for the detector to detect tone, the Examiner respectfully disagrees. As far as Yamano is concerned, the A/D must be operating in order for the non-idle detector to detect tone, since the device detects tones in the digital domain. The tone is a digital sample of the analog signal and converting from

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analog to digital requires sampling of a signal. Sampling requires at least some sort of buffer means, since it is not a process that happens instantaneously. Thus, the operation of the sample buffer is necessary for the non-idle signal detector to work. Furthermore, Yamano is concerned with using as little power as possible to detect the non-idle signal. It is unlikely that unnecessary parts of the receiver circuitry would be in operation if power reduction were the desired outcome.

4. In response to Applicants' argument that Yamano does not teach that "only a signal tone detector" is operative when data is not being transmitted, since Yamano fails to teach or suggest that adder 319 is inoperative under a "reduced processing" mode, the Examiner respectfully disagrees. Yamano discloses that echo canceller (309) is disabled in reduced processing mode, but does not explicitly state that adder (319) is disabled in this mode (col. 14, lines 29-42). However, Figure 4 shows that adder (319) is only needed for the echo canceling function, which is disabled during reduced processing mode. It is obvious that power need not be supplied to the adder in reduced processing mode since the goal is to use only enough power necessary to allow the tone detection function to operate.

### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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6. Claims 1, 3-6 and 8-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nimmagadda (US 6,426,961) in view of Yamano et al. (US 6,075,814) and Bartkowiak (US 6,665,350).

Regarding claims 1, 5, 6, 10 and 12, Nimmagadda discloses an ADSL system (Fig. 5) in which a subscriber uses a computer (30) and an ADSL modem (28) for use with ADSL system (106). An ADSL system makes use of twisted pair wiring to provide voice service and data service (col. 1, lines 19-25). The ADSL system also includes, at the other end of the subscriber voice and data line, a central office switch (16) connected to a PSTN (108). The ADSL system also includes an ADSL modem (18) at the telephone switch side that connects to an ISP (108) for connection to the Internet. Fig. 5 demonstrates that the core region of the telephone switch can be bypassed by sending data traffic through modem (18) to the ISP. This ISP represents the access device of the present invention. Nimmagadda does not expressly disclose that the ADSL modem (28), which meets the limitation of a high-bit-rate data transmission device, operates only a signal tone detector to detect an occurrence of a pilot tone in an upstream or downstream channel indicating a beginning of data transmission outside the context of data transmission, and operating the remaining parts only when the occurrence of the pilot tone is detected. Yamano discloses a receiver circuit (400) of a modem that includes a non-idle detector (401). When the non-idle detector detects a pure tone, which represents the presence of data, the receiver circuit is enabled in full processing mode (col. 14, lines 20-29). When no data is detected, the receiver circuit is operated in a reduced processing mode (col. 14, lines 29-42). Yamano fails to expressly disclose that only the signal tone detector is operated before the detection of a pilot tone, since it is evident from comparing the description of a reduced processing mode with

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Figure 4 that the A/D converter (301) and the sample buffer (308) are still operative when the receiver is in reduced processing mode. Bartkowiak discloses a tone detector that includes the functions of A/D conversion, sampling and detecting a tone in one device (see Figures 2A and 2B). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to use the receiver circuit of Yamano, wherein the non-idle detector, A/D converter and sample buffer were embodied in one tone detector component such as in the invention of Bartkowiak, in the ADSL modems (18) and (28) of Nimmagadda so that the modems would only be acting in full capacity when high-bit-rate data was being transmitted on the subscriber line. One of ordinary skill in the art would have been motivated to combine the non-idle detector, A/D converter and sample buffer into one component since the A/D converter and sample buffer provide functions that are necessary for the non-idle detector to detect the pure tone, and thus would be necessary to be operative even when the receiver circuit was in reduced processing mode. One of ordinary skill in the art would have been motivated to use the receiver circuit with a combined detector, A/D converter and sample buffer in a high-bit-rate modem to provide efficient processing and to reduce power consumption by the modem.

Regarding claims 3 and 8, see aforementioned teaching regarding claim 1. Additionally, Yamano discloses that the receiver circuit receives a continuous analog signal. The receiver circuit monitors this continuous analog signal (col. 3, lines 44-54).

Regarding claim 4, see aforementioned teaching regarding claim 1. The teaching of Nimmagadda in view of Yamano et al. and Bartkowiak above discloses an A/D converter for converting the analog signal to digital. Specifically, Bartkowiak discloses a component (202) for sampling an analog signal at discrete time intervals (see Figure 2A).

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Regarding claim 9, Yamano discloses that the non-idle detector (401) may periodically be enabled during predetermined time intervals (col. 15, lines 26-32).

Regarding claims 11 and 13, Figure 4 shows a resampler (302) and an equalizer (303), which are both digital signal processing components.

Regarding claim 14, Yamano discloses a reduced processing mode used during the absence of the easily detected signal on the communication channel (col. 14, lines 29-42)

7. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nimmagadda (US 6,426,961) in view of Yamano et al. (US 6,075,814) and Bartkowiak (US 6,665,350)) as applied to claims 1, 3-6 and 8-14 above, and further in view of Wallace et al. (US 6,353,628).

Regarding claim 7, Nimmagadda in view of Yamano and Bartkowiak discloses digital signal processing components such as resampler (302) and equalizer (303) that are switched on after detection of a pilot tone (col. 14, lines 29-42 of Yamano). Yamano also discloses an analog to digital converter, A/D (301), which comprises the analog and digital interfaces of claim 7. In order for data transmission to occur after detection of the pilot tone, this A/D converter would have to be switched on so that the receiver could process the incoming signal. Nimmagadda in view of Yamano and Bartkowiak fails to expressly disclose a line driver that is switched on after detection of a pilot tone. Wallace discloses that line terminating equipment (LTE) typically comprises a line driver that is coupled to a voltage supply and arranged to amplify signals to be applied to a wireline resource in a DSL communication system (col. 4, lines 31-37). Wallace also discloses that the line driver is re-enabled after coming out of a dormant mode due to inactivity (col. 8, line 43 – col. 9, line 14). At the time the invention was made, it would have

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been obvious to a person of ordinary skill in the art to provide a line driver in the system of Nimmagadda in view of Yamano and Bartkowiak, and to switch this line driver into an operative state upon detection of a pilot tone. One of ordinary skill in the art would have been motivated to do this in order to make sure data transmissions in the system would be sent with enough power to be successfully transmitted to a receiving circuit.

### *Conclusion*

8. Applicants' amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

9. Any inquiry concerning this communication, or earlier communications from the examiner should be directed to Thomas Volper whose telephone number is 703-305-8405 and fax number is 703-746-9467. The examiner can normally be reached between 8:30am and 5:00pm M-F.



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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy Vu, can be reached at 703-308-6602. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-4750.

Thomas E. Volper

*TEV*

August 11, 2004

A handwritten signature in black ink, appearing to read 'Huy D. Vu', with a long horizontal line extending to the right.

**HUY D. VU  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2600**